

actiDisk **rdx[®]**

Removable Hard Disk Storage System



User Guide

User Guide

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1. Introduction: actiDisk RDX Hard Disk Storage System

1.1 Overview

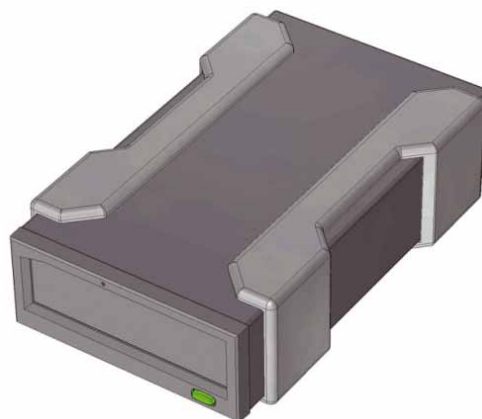
actiDisk RDX storage is a removable, ruggedized, hard disk drive system. It features backup application compatibility, high speed transfer rate for fast backups, portable cartridges and high level of data reliability. The storage system is available with an internal SATA or USB device (see **Figure 1**) or external USB device (see **Figure 2**).

Figure 1. actiDisk RDX Internal Docking Station



Internal Docking Stations (SATA or USB)

Figure 2. actiDisk RDX External Docking Station



External USB Docking Station

1.2 Capacity and Transfer Rates

The capacity and transfer rate of the actiDisk RDX storage system are outlined in the table below (see Table 1). Capacity and transfer rate will vary depending on the actiDisk RDX cartridge type used.

Table 1. Capacity and Transfer Rates

Characteristic	RDX 80 GB	RDX 120 GB	RDX 160 GB	RDX 320 GB	RDX 500 GB
	Media	Media	Media	Media	Media
Native capacity (GB)	80	120	160	320	500
Compressed capacity (GB)	160	240	320	640	1000
Average sustained transfer rate (MBs/sec)	SATA 30 MBps/USB 25 MBps				
Burst transfer rate	SATA 1.5 Gbps/USB 480 Mbps				
Average access time (msec)	15				
Function	Removable disk drive				
Command set	• Packet command feature set, per ATA/ATAPI-7 • SCSI primary commands (SPC-2) • SCSI block commands (SBC-2)				
Logical block size	512 bytes				
Supported file systems	ext2, ext3, FAT32 and NTFS*				

*NTFS is the default file system on the cartridge. If you are using Linux then the cartridge that comes with your system will need to be re-formatted to support a file system that is compatible with a Linux based operating system (see section „actiDisk RDX Cartridge File System Considerations“ in the appendix).

1.3 Supported Media

The actiDisk RDX system supports any actiDisk RDX cartridge. actiDisk RDX cartridges are available in different capacity configurations depending on your storage requirements.

1.4 Supported Operating Systems

The actiDisk RDX storage system is supported on the following operating systems:

- Windows Vista™
- Windows 2000 Service Pack 4
- Windows 2003 Service Pack 1 or later
- Windows XP Service Pack 2 or later
- Linux (see „Linux Compatibility“ section for more details)

1.5 Software

Retrospect® Backup Software

The actiDisk RDX storage system works with industry backup applications that support removable disk media. See your backup software manual for instructions on backing up data.

Windows Software

The actiDisk RDX User Guide and Utilities CD provides essential Windows® software for use with the actiDisk RDX system. The actiDisk RDX software for Windows installs:

- A removable disk utility that provides basic diagnostic tests capabilities and firmware upgrade
- An application update that enables the eject button to operate correctly under the Windows operating system
- An application that allows the right-click eject to operate in user-mode under the Windows operating system
- An application that automatically sets the SATA connection to DMA mode for improved performance

See „**Installing Utility Software for Windows**“ and „**Using the Removable Disk Utility**“ sections for more information on these applications.

Linux Software

There is no special software necessary when running Linux operating system. See „**Using the Linux Operating System**“ appendix for more information on using the actiDisk RDX system with Linux.

1.6 Front Panel Features

The front of the actiDisk RDX docking station has the following features and indicators:

- Cartridge Indicator (located on cartridge) (1)
- Emergency Eject Hole (2)
- Eject Button/Power Indicator (3)

Figure 3. Front Panel Features

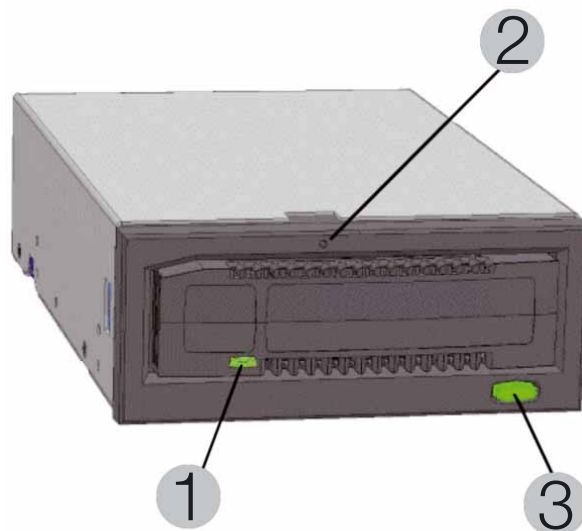


Table 2. Power Indicator

The eject button is illuminated by a power indicator. Table 2 describes the operation of this indicator:

Indicator Status	Meaning	Description
OFF	No Power	Docking station does not have power
Steady GREEN	Ready	Power is on and the actiDisk RDX docking station is working properly
Blinking GREEN	Ejecting	Cartridge is ejecting
Steady AMBER	Fault	actiDisk RDX docking station has detected a fault condition. For more information, run a diagnostic application (see section „ Using the Removable Disk Utility “).
Blinking AMBER	Prevent	Host computer is accessing the media, and the user has pressed the eject button. The indicator will blink amber for a few seconds then return to a steady green. The cartridge will eject after the host access completes.

Table 3. Cartridge Indicator

The cartridge indicator displays the current status of the cartridge. Table 3 describes the operation of this indicator:

Indicator Status	Meaning	Description
OFF	Not Ready	Cartridge is not inserted properly or the docking station has no power
Steady GREEN	Ready	Cartridge is ready
Blinking GREEN	Activity	Reading, writing, seeking
Steady AMBER	Fault	actiDisk RDX docking station has detected a cartridge fault condition. For more information, run a diagnostic application (see section „ Using the Removable Disk Utility “).

2. Quick Start Installation: actiDisk RDX Removable Hard Disk Storage System

2.1 actiDisk RDX Internal (SATA or USB) Docking Station (Customer Kit)

This section describes how a user can install the actiDisk RDX Internal drive.

Before You Begin

The actiDisk RDX docking station ships ready to install in a standard 5.25-inch half-high drive bay.

Depending on your computer you may need a standard (flat-blade) or Philips screwdriver to remove the computer cover and install the drive in your computer.

Important Information on Electro-Static Damage

To protect your computer and docking station from electro-static damage (ESD), follow these guidelines:

Note: Your computer must be plugged into a grounded electrical outlet to be properly grounded.

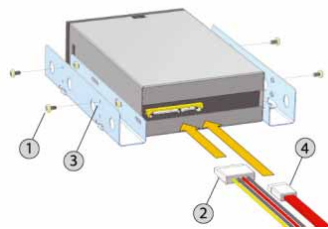
- Before you open your computer or remove the actiDisk RDX docking station from its antistatic bag, ground yourself by touching the metal chassis of your computer or some other grounded object.
For optimal protection, use an electrostatic grounding strap.
- Do not touch any printed circuit boards or electronic chips on your actiDisk RDX docking station or in your computer.
- Turn your computer and any peripheral devices off before installing the actiDisk RDX docking station.

Installation Instructions

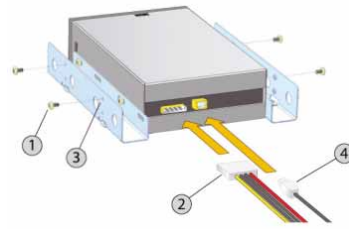
- 1 Carefully unpack the docking station and accessories.
- 2 Turn off the computer.
- 3 Open the computer cover, using a screwdriver if necessary.
- 4 Mount the docking station. Slide the actiDisk RDX docking station into an unused drive bay until the bezel is flush with the front of the computer. Secure the docking station using mounting screws, being careful not to over-tighten the screws (see Figure 1 below).
- 5 Attach the power cable to the power connector (see Figure 1 below).
- 6 Connect the data cable (SATA or USB) to the data connector (SATA or USB) (see Figure 1 on next page).
For USB installation, connect the other end of the cable to the appropriate USB connector on the motherboard.
- 7 Check all cables in your computer system. Before you reinstall your computer cover ensure that all cables are correctly routed so that they will not bind or become crimped. Also, make sure that no cables have loosened during the installation.
- 8 Replace your computer cover.
- 9 Turn on the computer.
- 10 (For SATA units only.) During power-up press F2 key, or other hot key, to enter BIOS set up mode.
Enable the SATA port connected to your actiDisk RDX docking station. Save changes and exit from BIOS.
- 11 If running Windows install the actiDisk RDX software (see „Installing Utility Software for Windows“).
- 12 If you are using the Linux operating system see the appendix „Using the Linux Operating System“.

NOTE: If you choose to install a new operating system on your computer with an actiDisk RDX docking station attached, make sure the cartridge is removed. This prevents the operating system from confusing the removable drive with the system drive.

Figure 1. actiDisk RDX Internal Connectors



Internal SATA Docking Station



Internal USB Docking Station

- (1) Mounting Screws
- (2) Power Adapter Cable
- (3) Mounting Holes
- (4) SATA Data Cable/USB Cable

2.2 Installing the actiDisk RDX USB Removable Disk Docking Station

- 1 Carefully unpack the docking station and accessories.
- 2 Attach the USB cable to USB port on the back of the actiDisk RDX docking station and connect it to an available USB 2.0 port on the computer (see **Figure 2** below).
- 3 Attach the power cable to the power connector (see **Figure 2** below) and plug it into an outlet.
- 4 Select a convenient location for the actiDisk RDX External drive that is flat, sturdy, level and close to the host server. The drive can be oriented horizontally or vertically.
- 5 If running Windows install the actiDisk RDX software (see „Installing Utility Software for Windows“).
- 6 If you are using the Linux operating system see appendix „Using the Linux Operating System“.

Figure 2. actiDisk RDX External USB Connectors



- (1) AC Power Adapter
- (2) USB Cable

2.3 Installing Utility Software for Windows

NOTE: It is required to install the actiDisk RDX utility software on Windows operating systems for proper functioning.

The actiDisk RDX User Guide and Utilities CD provides essential Windows® software for use with the actiDisk RDX docking station. The actiDisk RDX utility software for Windows installs:

- A removable disk utility that provides basic diagnostic tests capabilities and firmware upgrades
- An application update that enables the eject button to operate correctly under the Windows operating system
- An application that allows the right-click eject to operate in user-mode under the Windows operating system
- An application that automatically sets the SATA connection to DMA mode for improved performance

The software included on this CD will start automatically when a user inserts the CD and will not interfere with any other applications running on your computer.

NOTE: If the actiDisk RDX software is not installed the eject button and right-click eject method may not work properly.

To install the software (Microsoft® Windows Vista/XP/Server 2003/Windows 2000):

NOTE: You must be logged in as the Administrator or have administrator privileges to install the software.

- 1 Insert the actiDisk RDX User Guide and Utilities CD into the CD-ROM drive on the computer.
- 2 The CD will automatically start the installation process.
- 3 Re-start the computer.

NOTE: If the CD does not autorun, then perform the following steps.

- 1 Windows Explorer to browse to the CD-ROM drive (i.e. D:).
 - 2 Double click on **InstallRDX.exe** to install the program. This installer will copy files into C:/Program Files/RDX.
 - 3 Re-start the computer.
- Your new actiDisk RDX system is ready for use. See your backup software manual for instructions on backing up data.

3. Using the actiDisk RDX Removable Hard Disk Storage System

3.1 Operating the actiDisk RDX System

This section describes typical activities involved in operating and maintaining the actiDisk RDX system. For instructions on using your backup software, see the manual that came with your software.

3.2 Handling the actiDisk RDX Cartridges

Although actiDisk RDX cartridges are rugged, it is always best practice to take extra care not to drop them when handling. This will ensure data integrity and long life. Observe the following precautions:

- Store cartridges in their protective cases when you are not using them.
- Do not stack actiDisk RDX cartridges.
- Keep cartridges away from dust, dirt and moisture.
- Avoid direct sunlight, heat sources and temperature extremes or rapid changes in temperature.
- Never try to force the cartridge into the docking station. If it is difficult to insert, check the orientation and insure correct alignment using keyed corner as a guide.

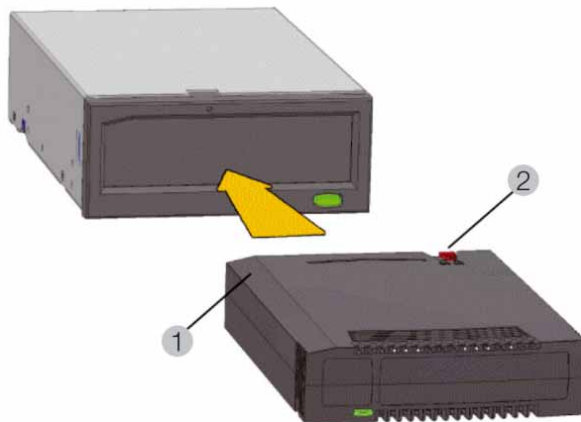
3.3 Loading and Unloading Cartridges

The front of your docking station has an opening for inserting actiDisk RDX cartridges. A protective door covers the opening. Below and to the right of the door is the power indicator that doubles as a cartridge-eject button.

To Load a Cartridge

Insert the cartridge in the docking station with the keyed corner facing the upper left corner of the docking station and the write-protect tab on the back right (see **Figure 1**). The cartridge only fits in one orientation. Push the cartridge gently into the docking station until it is locked in place with a clicking sound.

Figure 1. Loading the Cartridge



- (1) Keyed Corner
(2) Write Protect Tab

To Unload a Cartridge

To unload a cartridge using the mouse right-click method (Windows only):

- 1 While running Windows® Explorer locate the drive letter for the device.
- 2 Right-click on the device and select **Eject**.
- 3 When the cartridge has been ejected by the docking station, grasp the exposed sides of the cartridge and pull the cartridge straight out (see **Figure 2**).

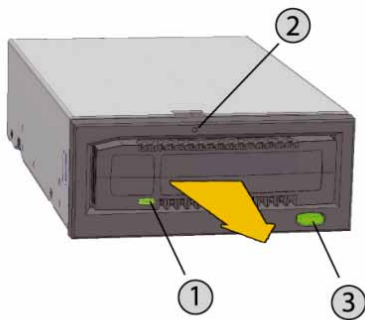
To unload a cartridge using the eject button:

- 1 Push the eject button.
- 2 When the cartridge has been ejected by the docking station, grasp the exposed sides of the cartridge and pull the cartridge straight out (see **Figure 2**).

NOTE: If the actiDisk RDX software is not installed the eject button and right-click eject method may not work properly (see section „Installing Utility Software for Windows“).

NOTE: Under proper operation, the drive bay will make an audible noise during the ejection process. If the cartridge does not eject see the „Troubleshooting“ section for more details.

Figure 2. Unloading the Cartridge



- (1) Cartridge Indicator (located on cartridge)
(2) Emergency Eject Hole
(3) Eject Button/Power Indicator

To Emergency Eject a Cartridge

NOTE: Do not emergency eject a actiDisk RDX cartridge while the cartridge activity indicator is flashing.

If the cartridge does not eject, using either the eject button or the right-click eject methods then use the following emergency eject hole method to recover the cartridge:

- 1 If using the actiDisk RDX Internal docking station, turn off your computer. If using the actiDisk RDX External docking station, unplug the power cable.
- 2 Insert a large straightened paper clip (or similar object) into the Emergency Eject Hole (see Figure 2). Do not insert the object in the hole at an angle. Keep the object straight and apply some force to eject the cartridge.
- 3 When the cartridge has been ejected by the docking station, grasp the exposed sides of the cartridge and pull the cartridge straight out (see Figure 2).
- 4 Re-start your computer to reset the actiDisk RDX docking station. If using the actiDisk RDX External docking station, re-plug in the power cable for the docking station and then re-start your computer.

4. Using the actiDisk RDX Removable Disk Utility

4.1 Overview

The actiDisk RDX Utility is a Windows® application that allows you to diagnose problems with your actiDisk RDX docking station. With the utility, you can:

- Identify actiDisk RDX docking station attached to your computer.
- Retrieve device and cartridge status information.
- Test the docking station and the cartridge.
- Upgrade docking station firmware.

4.2 Using Removable Disk Utility

To run the actiDisk RDX Utility for Windows:

Click **Start → All Programs → actiDisk RDX → actiDisk RDX Utility**.

For instructions on using removable disk utility, click Help.

If the software is not installed on your computer, see the section „Installing Utility Software for Windows“ for installation instructions.

5. actiDisk RDX Removable Hard Disk Storage System Troubleshooting

5.1 The Power Indicator is OFF

actiDisk RDX Internal Docking Station

If the power indicator is off, the actiDisk RDX Internal docking station does not have power. Follow these steps to verify the cable connections in the rear of the docking station:

- 1 Turn off the computer.
- 2 Check the power and data cable connections in the rear of the docking station.
- 3 Turn on the computer.

actiDisk RDX External Docking station

If the power indicator is off, the actiDisk RDX External docking station does not have power. Follow these steps to verify the cable connections in the rear of the docking station:

- 1 Check power connection at the back of the docking station.
- 2 Check that the power adapter is plugged into an outlet.
- 3 If plugged into an outlet strip make sure that it is turned on.

5.2 The Power Indicator is Steady AMBER

If the power indicator is a steady amber, the actiDisk RDX docking station is not working properly. The error is due to one of the following conditions:

- The docking station cannot eject the cartridge due to an obstruction.
- The internal electronics are damaged or malfunctioning.

Follow these steps to remove a stuck cartridge:

- 1 If using the actiDisk RDX Internal docking station, turn off your computer. If using the actiDisk RDX External docking station, unplug the power cable.
- 2 Insert a large straightened paper clip (or similar object) into the Emergency Eject Hole (see **Figure 2** in the „Using the Drive: Loading and Unloading Cartridges“ section). Do not insert the object in the hole at an angle. Keep the object straight and apply some force to eject the cartridge.
- 3 When the cartridge has been ejected by the docking station, grasp the exposed sides of the cartridge and pull the cartridge straight out.
- 4 Re-start your computer to reset the actiDisk RDX docking station. If using the actiDisk RDX External docking station, re-plug in the power cable for the docking station and then re-start your computer.

5.3 The Power Indicator is Blinking AMBER, and the Cartridge Does Not Eject

If the power indicator is blinking amber after you press the eject button, the Host computer is accessing the media. The actiDisk RDX docking station will eject the cartridge after the Host access completes.

If the cartridge does not eject after the Host computer access completes, you may not be running the correct utility software. See the „Installing Utility Software for Windows“ section for instructions on installing the software.

If the cartridge still does not eject, use Windows Explorer to eject the cartridge. In Windows® Explorer, right-click on the drive letter for the actiDisk RDX docking station (i.e. F:), and select **Eject**.

5.4 The Cartridge Indicator is Steady AMBER

The cartridge indicator is located on the front of the cartridge. If this indicator is amber, the cartridge is not working properly. The error is due to one of the following conditions:

- The cartridge is not compatible with the actiDisk RDX docking station.
- The cartridge has been severely damaged.
- The cartridge has not been fully inserted.

Run the removable disk utility to obtain more information about the failure. See section „**Using the Removable Disk Utility**“.

5.5 The Cartridge Does Not Eject

If the cartridge does not eject, verify that you have installed the utility software. See the „**Installing Utility Software for Windows**“ section for instructions on installing the software.

Follow these steps to remove a stuck cartridge:

- 1 If using the actiDisk RDX Internal docking station, turn off your computer. If using the actiDisk RDX External docking station, unplug the power cable.
- 2 Insert a large straightened paper clip (or similar object) into the Emergency Eject Hole (see **Figure 2** in the “**Using the Drive: Loading and Unloading Cartridges**” section). Do not insert the object in the hole at an angle. Keep the object straight and apply some force to eject the cartridge.
- 3 When the cartridge has been ejected by the docking station, grasp the exposed sides of the cartridge and pull the cartridge straight out.
- 4 Re-start your computer to reset the actiDisk RDX docking station. If using the actiDisk RDX External docking station, re-plug in the power cable for the docking station and then re-start your computer.

NOTE: When the emergency eject is used the computer's operating system will lose recognition of the actiDisk RDX media. Therefore, one of the following options can be preformed to restore recognition.

- 1 Re-start the computer (recommended).
- 2 Follow steps 1-4 in „**The Docking Station does Not Appear in the Device Manager (Windows)**“ section if re-starting the computer is not desired.

5.6 The Docking Station Does Not Appear in the Device Manager (Windows)

If the docking station does not appear in the Windows Device Manager and the power indicator is green, follow these steps to rescan the hardware:

- 1 Bring up the Device Manager:
 - a Right-click on **My Computer**
 - b Select **Manage**
 - c Select **Device Manager**
- 2 Right-click on the top folder (this should be your computer's name).
- 3 Select **Scan for Hardware Changes**.
- 4 You should see your actiDisk RDX device listed under **Disk drives**. If the device does not appear, re-start the computer.

5.7 Docking Station Performance Seems Slow

actiDisk RDX Internal Docking Station

Some system SATA ports do not by default operate in DMA mode for the actiDisk RDX Internal device. This results in slower performance and weaker data protection. Reinstall the utility software for Windows to set the SATA ports to the correct mode. Refer to „**Installing Utility Software for Windows**“ section.

actiDisk RDX External Docking Station

The actiDisk RDX External device may appear slow based on the type of USB port the device is attached to. Make sure your docking station is connected to a USB 2.0 port instead of a USB 1.1 port. For best performance, connect directly to a USB 2.0 root hub on the PC and not an external hub.

The USB bus shares bandwidth between all USB devices connected to the systems, including the actiDisk RDX External docking station. The use of cameras, flash memory devices, etc. on the USB bus may decrease performance of the device. Remove extra devices if they are not necessary.

If running Windows 2000 see section „**Slow Performance with actiDisk RDX External and Windows 2000**“ for additional information.

Linux Users

Systems running Linux may see reduced performance when doing backups on actiDisk RDX cartridges configured for FAT32. For best performance, configure the file system on the actiDisk RDX cartridges for ext2 or ext3. See section „**actiDisk RDX Cartridge File System Considerations**“ in the appendix.

5.8 Write Error

If the backup application reports a write error, follow these steps:

- 1 Verify that the write protect switch on the cartridge is set to the “unlock” position.
- 2 Check the cartridge indicator on the front of the cartridge. If this indicator is amber, the cartridge is not working properly. This may be due to severe damage to the cartridge. Run the actiDisk RDX utility software to obtain more information about the failure.
- 3 Replace the cartridge if the error persists.

5.9 Firmware Download Fails with Windows Server 2003

If the firmware download fails with error invalid parameter and you are using Windows Server 2003, check to ensure you have at least Service Pack 1 installed.

5.10 Windows 2000 Cannot Eject Cartridge

When attempting to eject a cartridge while connected to the Windows 2000 operating system, ensure that any open **Windows Explorer** windows are not selecting the removable device. Windows 2000 will not allow the cartridge to be ejected when the removable drive is selected. When using the eject button, the button will flash amber and the cartridge will not eject. When using the right-click eject function of windows explorer, an error message will be displayed indicating that the drive is in use.

Close all open Windows Explorer windows and try again.

5.11 Slow Performance with actiDisk RDX External Docking Station and Windows 2000

USB 2.0 Drivers are not installed for any USB 2.0 controllers by default with a Windows 2000 installation. The device will operate at a slower USB 1.1 speed until the USB 2.0 drivers are installed. To install the USB 2.0 drivers, follow the steps below:

- 1 Right click on the **My Computer** icon and select **Manage**
- 2 Select **Device Manager**
- 3 Right click on the **Universal Serial Bus Controller** listed in the “other devices” section
- 4 Select **Properties**
- 5 Select **Update Driver** and follow the instructions to update USB 2.0 drivers.

5.12 System Will Not Complete Boot Process with actiDisk RDX External Docking Station

Some versions of BIOS do not handle large USB removable media correctly. If your system will not complete the boot process with the actiDisk RDX External device attached, follow the steps below:

- 1 Make sure you are using the latest BIOS for your system.
- 2 Disable USB boot in the BIOS and retry.
- 3 Attempt to eject the cartridge and retry boot, or boot with the actiDisk RDX device disconnected.
- 4 If using a FAT32 formatted cartridge, reformatting to another file system may fix the problem.

6. actiDisk RDX Removable Hard Disk Storage System Specifications

6.1 General

Manufacturer	actidata
Model Names	actiDisk RDX-SATA, actiDisk RDX-USB-INT and actiDisk RDX-USB
Interface Type	Internal SATA, Internal USB or External USB

6.2 Performance

Characteristic	RDX 80 GB	RDX 120 GB	RDX 160 GB	RDX 320 GB	RDX 500 GB
	Media	Media	Media	Media	Media
Native capacity (GB)	80	120	160	320	500
Compressed capacity (GB)	160	240	320	640	1000
Average sustained transfer rate (MBs/sec)	SATA 30 MBps/USB 25 MBps				
Burst transfer rate	SATA 1.5 Gbps/USB 480 Mbps				
Average access time (msec)	15				
Function	Removable disk drive				
Command set	• Packet command feature set, per ATA/ATAPI-7 • SCSI primary commands (SPC-2) • SCSI block commands (SBC-2)				
Logical block size	512 bytes				
Supported file systems	ext2, ext3, FAT32 and NTFS*				

Capacity and transfer rate will vary depending on the actiDisk RDX cartridge type used.

*NTFS is the default file system on the cartridge.

6.3 Reliability

Unrecoverable error rate	1 error per 10 ¹⁴ bits read
MTBF	550,000 hours

6.4 Physical

	actiDisk RDX Internal Docking Station	actiDisk RDX External Docking Station	actiDisk RDX Media
Form Factor	5.25 inch half-height internal	External	Removable Cartridge
Height	41.4 mm (1.63 inch)	51.8 mm (2.04 inch)	23.68 mm (0.93 inch)
Width	146.0 mm (5.75 inch)	109.8 mm (4.32 inch)	86.6 mm (3.4 inch)
Depth	171.9 mm (6.77 inch) including bezel	177.5 mm (7.00 inch) including bezel	119.18 mm (4.69 inch)
Weight	635 g (1.40 lbs)	540 g (1.19 lbs)	173 g (0.38 lbs)

6.5 Power

	Internal actiDisk RDX Docking Station	External actiDisk RDX Docking Station
Voltage Tolerance	+5VDC $\pm$ 5% (SATA and USB) +12VDC $\pm$ 10% (USB)	+12VDC $\pm$ 10%
Power Consumption (Typical/Peak)	7.5W/13W (SATA) 6.6W/20W (USB)	6.6W/13W
AC Adapter	N/A	Universal Adapter 100-240 VAC, 50-60Hz input

6.6 Environmental

actiDisk RDX Docking Station	Operational	Non-Operational
Temperature	10 to 40°C	-40 to 65°C
Thermal Gradient	10°C/hour	20°C/hour
Relative Humidity	20 to 80%, non-condensing	10 to 90%, non-condensing
Maximum Wet Bulb Temperature	29°C, non-condensing	38°C, non-condensing
Altitude	-50 ft to 10,000 ft	-50 ft to 35,000 ft
Vibration	sine vib 0.25G peak, 3-200 Hz	random vib 1.54G RMS
Shock	half sine 31G @ 2.6ms	half sine 71G @ 2 ms

7. actiDisk RDX Removable Hard Disk Storage System Regulatory

7.1 Environmental

- WEEE: product is registered and labeled as not appropriate for common disposal.
- RoHS: all materials and processes used in the system meet the limits for compliance.
- 7.2 Emissions
- (USA) Meets FCC requirements as specified in FCC 47CFR 15B clB –47 Part 15 Subpart B Unintentional Radiator.
- (Europe) Meets the CE requirements as specified in EMC Directive 89/336/EEC, CISPR 22 & CISPR 24/.
- (Australia & New Zealand) C-Tick
- (Japan) VCCI
- (Taiwan) BSMI

8. Using the Linux Operating System: actiDisk RDX Removable Hard Disk Storage System Appendix

8.1 Overview

This document describes the use of actiDisk RDX removable disk docking stations on Linux operating systems. There are two models of the actiDisk RDX docking station: an internal SATA version and an external USB version. Both SATA and USB models support Linux.

8.2 Linux Compatibility

There are a large number of possible Linux distributions which will support the actiDisk RDX docking stations natively. The Linux distributions listed in the table below have been tested and found compliant (see **Table 1**).

Table 1. Compatibility

Linux Distribution	actiDisk RDX Internal SATA	actiDisk RDX External USB
RHEL 3.0 Update 7	Supported	Supported
RHEL 4.0 Update 3	Supported	Supported
SLES 10 x64	Supported	Supported
SLES 9 Service Pack 3 x64	Not Supported	Supported

SLES – SUSE Linux Enterprise Server (Novell)

RHEL – Red Hat Enterprise Linux

SLES 9 Service Pack 3 does not support SATA ATAPI devices and therefore does not support the actiDisk RDX Internal SATA product.

8.3 Using the actiDisk RDX System with Linux

actiDisk RDX Cartridge File System Considerations

The actiDisk RDX cartridge is formatted as NTFS at point of sale. NTFS format does not allow writes in a Linux operating system.

Your cartridge must be reformatted to a different file system supported by Linux, such as FAT32, ext2, and ext3, etc. Please refer to the man pages for **fdisk** and **mkfs** for detailed instructions on how to manipulate partition table and create file systems on Linux. If creating multiple partitions on a cartridge, see section „Eject“ below.

- The choice of the file system also has significant impact on backup performance. Ext3 typically gives the best overall performance.
- The FAT32 file system has a 4GB file size limit which can limit archive sizes when using tar.
- Some system BIOS do not handle FAT32 formatted disk volumes correctly and may hang on boot. This typically occurs when USB boot is enabled in the BIOS. See „**System Will Not Complete Boot Process with actiDisk RDX External**“ section in „Troubleshooting“ for more information.

NOTE: Although **mkfs** will allow format of un-partitioned media, we recommend always using **fdisk** to create partitioned media before formatting. Issues exist with the 2.4 kernel and **umount** when using un-partitioned media.

Automount

A cartridge must be mounted in order to for it to be accessible by the backup application. Some Linux distributions include pre-configured **automount** for removable disks, others may require user configuration. Please refer to the man pages for **automount** for more information.

Eject

If the cartridge is mounted, the eject button on the actiDisk RDX drive will not work properly. Use the eject command to unmount and **eject** the cartridge.

NOTE: The eject command cannot properly handle un-mount if multiple partitions are present on a removable disk. Each mounted partition must be un-mounted manually or the eject command will fail.

Backup With tar

The **tar** command works with actiDisk RDX docking stations by writing the archive to a file on the cartridge. Use the tar -M option to create archives which span multiple cartridges on the actiDisk RDX docking station. For spanning removable disk cartridges use the tar -M -L size option (where size is the cartridge capacity in kilobytes) when creating multiple-volume backups. For more information refer to the man page for tar.

8.4 Troubleshooting

SCSI Device Status

To find out whether the actiDisk RDX drive is recognized by the system, issue the following command:

```
cat /proc/scsi/scsi
```

This will print out a list of all the SCSI devices in the system. The list should include any actiDisk RDX drives recognized by the system. If the actiDisk RDX docking station is not listed, check cable connections and power supplies (and BIOS settings for the SATA product.)

e2fsck File System Check Fails

If the **e2fsck** program is unable to successfully complete the file check of an ext2/ext3 cartridge, check to make sure you have the latest version of e2fsprogs installed. Under certain circumstances, earlier versions (pre 1.35) of **e2fsck** included with some distribution are unable to complete the file systems check.

Product Registration and Support

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